

IN THE CLAIMS:

In line 1, delete "Claims" and insert:

C L A I M S

What is claimed is:

Please amend claims 1-21 to read as follows:

1. (Currently Amended) ~~Apparatus~~ In apparatus for the measurement of physical and/or chemical quantities using
 - ☐ a light source ~~(122)~~ and a light guide ~~(124)~~ to couple the light of the light source ~~(122)~~ in an optical resonator ~~(12)~~ shaped as microparticle, and
 - ☐ ~~and means (128)~~ for the observation of the light decoupled from the resonator ~~(12)~~,

~~characterized in that~~ the improvement wherein

 - ☐ the resonator ~~(12)~~ is at least partly mounted in a cutout ~~(18)~~ formed in the light guide ~~(124)~~ and fixed there mechanically and coupled optically to the light guide ~~(124)~~.

2. (Currently Amended) Apparatus according to claim 1,
wherein

- the cutout ~~(18)~~ is formed on a free end of the light guide ~~(124)~~ having an opening to the front side ~~(20)~~ of the light guide ~~(124)~~.

3. (Currently Amended) Apparatus according to ~~one of the preceding claims~~ claim 1, wherein

- the light guide ~~(124)~~ is a hollow waveguide ~~(34, 44)~~.

4. (Currently Amended) Apparatus according to claim 3,
wherein

- the hollow waveguide ~~(34, 44)~~ has at least ~~on~~ at a first ~~place~~ position a larger inner diameter than ~~on~~ at a second ~~place~~ position, ~~The~~ the first ~~place is~~ position being close to ~~the~~ a free end; and the second ~~place is~~ position being farther from the free end.

5. (Currently Amended) Apparatus according to ~~one of the preceding claims~~ claim 1, wherein

- only one light guide ~~(124)~~ is present, and

- ☐ ~~where in~~ wherein the light guide ~~(124)~~ light propagates in a first propagation direction from the light source ~~(122)~~ to the resonator ~~(12)~~ and back from the resonator ~~(12)~~ in a second, opposite propagation direction.

6. (Currently Amended) Apparatus according to ~~one of the preceding claims~~ claim 1, wherein

- ☐ the resonator ~~(12)~~ contacts the light guide ~~(124)~~ on at at least two locations = which are separated by a distance, = and the resonator is held there in contact by clamping.

7. (Currently Amended) Apparatus according to ~~one of the preceding claims 1 to 5~~ claim 1, wherein

- ☐ the resonator ~~(12)~~ is positioned on the light guide ~~(124)~~ in such a way that a gap remains between the resonator ~~(12)~~ and a light guiding part ~~(34)~~ of the light guide.

8. (Currently Amended) Apparatus according to ~~one of the preceding claims~~ claim 1, wherein

- ☐ the light guide ~~(124)~~ is tapered on at its free end.

9. (Currently Amended) Apparatus according to ~~one of the preceding claims~~ claim 1, wherein

- the light guide ~~(124)~~ is ~~covered on~~ closed at its free end by at least one of a cap ~~(82)~~ ~~or closed by~~ and a sealing compound ~~(92)~~.

10. (Currently Amended) Apparatus according to ~~one of the preceding claims~~ claim 1, wherein

- the light guide ~~(124)~~ has at least one lengthwise slit ~~(52, 62)~~ on its end.

11. (Currently Amended) Apparatus to measure physical and/or chemical quantities by a

- light source ~~(192)~~ and several light guides ~~(194, 195)~~ to couple light from the light source ~~(192)~~ in a resonator ~~(12)~~ shaped as a microparticle,
- and means ~~(198)~~ to observe light decoupled from the resonator ~~(12)~~,

~~characterized in that~~ the improvement wherein

- the resonator ~~(12)~~ is placed in the front part of a wedge-shaped sensing tip ~~(132)~~ with two converging bars ~~(134a, 134b)~~,
- ~~where~~ wherein the bars, ~~(133a, 133b)~~ or parts it consist consists of, light transmitting material and are coupled to two light guides ~~(194, 195)~~ on the rear end of the measuring tip; and wherein ~~(132)~~. A first of said light guides ~~(194, 195)~~ is connected to the light source ~~(192)~~ and a second light guide ~~(194, 195)~~ is connected to ~~the~~ an evaluation device ~~tool~~ ~~(198)~~.

12. (Currently Amended) Apparatus according to claim 11, wherein

- the rear part of the measuring tip ~~(132)~~ has a socket ~~(131, 150)~~ with openings ~~(142a, 142b, 152a, 152b)~~ to accept the light guides ~~(194, 195)~~, and
- ~~where~~ wherein said light guides ~~(194, 195)~~ are fitted in the openings ~~(142a, 142b, 152a, 152b)~~ and optically coupled to the light guiding material of the bars ~~(133a, 133b)~~.

13. (Currently Amended) Apparatus according to claim 11 ~~and~~
12, wherein

- the sensing tip ~~(132)~~ has at least one of a ground
plate ~~(135)~~ ~~and/or~~ and a cover plate ~~(136)~~.

14. (Currently Amended) Apparatus according to claim 13,
wherein

- the cover plate ~~(136)~~ ~~and/or~~ and the ground plate ~~(135)~~
~~has~~ have one or several lengthwise slits ~~(138)~~ at least
in ~~the~~ a front part thereof.

15. (Currently Amended) Apparatus according to claim 13 ~~or~~
14, wherein

- the cover plate ~~(136)~~ ~~and/or~~ and the ground plate ~~(135)~~
~~has~~ have one lengthwise guide groove ~~(160, 180)~~ at
least in ~~the~~ a front part thereof.

16. (Currently Amended) Apparatus according to ~~one of the~~
~~preceding claims~~ claim 11, wherein

- several resonators ~~(12a, 12b, 12c, 12d, 12e)~~ are
present; and

- ☐ said resonators ~~(12a, 12b, 12c, 12d, 12e)~~ are coupled to the same light guide ~~(102, 112)~~ or to the same light guides ~~(194, 195)~~.

17. (Currently Amended) Apparatus according to claim 16, wherein

- ☐ the resonators ~~(12a, 12b, 12c, 12d, 12e)~~ are made in such a way, that their particular optical resonances are excited by light with different frequencies.

18. (Currently Amended) Apparatus according to ~~one of the preceding claims~~ claim 11, wherein

- ☐ the resonator or the resonators ~~(12, 12a, 12b, 12c, 12d, 12e)~~ are shaped spherically or as ellipsoids.

19. (Currently Amended) Apparatus according to ~~one of the preceding claims~~ claim 11, wherein

- ☐ the light source ~~(122, 192)~~ is addressable to generate light with different wavelengths, and
- ☐ and the evaluation devices ~~(128, 198)~~ measure the intensity of the light decoupled from the resonator ~~(12)~~.

20. (Currently Amended) Apparatus according to ~~one of the~~
~~claims 1-18~~ claim 11, wherein

- ☐ the light source ~~(122, 192)~~ emits broadband light; and
- ☐ and the evaluation devices ~~(128, 198)~~ measure device
measures the intensity of the light decoupled from the
resonator ~~(12)~~ in dependence upon frequency dependent.

21. (Currently Amended) Apparatus according to claim 20,
wherein

- ☐ the material of the resonator ~~(12)~~ is excited to
fluorescence.